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DANIELS, MATTHEW J	
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Please find below and/or attached an Office communication concerning this application or proceeding.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte L. ROBERT DEARDURFF

Appeal 2008-3563
Application 10/689,357
Technology Center 1700

Decided:[1] February 17, 2009

Before CHUNG K. PAK, JEFFREY T. SMITH, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1 through 10, which are all of the claims

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the decided date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

pending in the above-identified application. We have jurisdiction pursuant to 35 U.S.C. § 6.

The subject matter on appeal is directed to "generally to a process for preparing a blow molding preform…[m]ore particularly,…to a process for conditioning the melt polymer stream from an extruder, prior to the injection molding of a blow molding preform" (Spec. 1, ll. 10-15). Details of the appealed subject matter are recited in representative independent claims 1 and 4 reproduced from the Claims Appendix to the Appeal Brief as follows[2]:

1. A process for preparing a blow molding preform, comprising:

melting polymer flakes in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder;

cooling the polymer melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature, by heat exchange with a liquid heat transfer medium; and

forming the cooled polymer melt into a blow molding preform.

4. The process for preparing a blow molding perform according to Claim 1, wherein the polymer flakes comprise an average mean particle size from about 1/8 to about 3/4 inch.

According to page 4, lines 1-16, of the Specification,

[2] To the extent that Appellant has presented substantive arguments for separate patentability of any individual claims on appeal, we will address them separately consistent with 37 C.F.R. § 41.37(c)(1)(vii) (2005).

> The polymer flakes that are useful in the present invention may comprise any plastic, or combinations, blends, or copolymers of plastics, *known to be useful* in the blow molding of containers. Suitable examples comprise, but are not necessarily limited to polyethylene terephthalate (hereinafter, PET), polyolefin, polyester, polyamide, acrylonitrile acid ester, vinyl chloride, and derivatives, blends, and copolymers thereof….
>
> By the term "polymer flakes" as it is used herein is meant particles of those polymers set-forth above, which are generally *commercially available in the form of flakes, chunks, sphere, pellets, and the like,* and which are generally made *commercially available* in bulk in a substantially uniform average mean particles size from about 1/8 inch to about ¾ inch. [Emphasis added.]

As evidence of unpatentability of the appealed subject matter, the Examiner has proffered the following prior art references:

Bright	US 4,622,001	Nov. 11, 1986
Schwarzkopf	US 4,642,043	Feb. 10, 1987
Belcher	US 4,988,279	Jan. 29, 1991
Hata	US 5,411,686	May 2, 1995
Takahashi	US 6,320,014 B1	Nov. 20, 2001

The Examiner has rejected the claims on appeal as follows:

1) Claims 1 through 3 and 5 through 10 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Bright and Hata;

2) Claim 4 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Bright, Hata, and Takahashi;

3) Claims 1 through 3 and 5 through 10 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Belcher and Schwarzkopf; and

4) Claim 4 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Belcher, Schwarzkopf, and Takahashi.

Appellant appeals from the Examiner's decision rejecting the claims on appeal under 35 U.S.C. § 103(a).

RELEVANT FACTUAL FINDINGS (FF)

The Factual Findings set forth below are supported by a preponderance of the evidence of record:

REJECTIONS (1) AND (2)

1. Appellant does not dispute the Examiner's finding that Bright teaches a process for preparing an article which can be used as a blow molding preform. (*Compare* Ans. 3 *with* Br. 6-8).

2. Bright teaches providing molten polyethylene terephthalate (PET) from a plasticating and injection unit subject to a temperature above about 275° C to a preform mold via a heated nozzle unit coupled to the plasticating and injection unit (col. 1, ll. 52-60 and col. 3, ll. 17-45).

3. Bright teaches (col. 1, ll. 58-68) that:

> Upon injection of the PET into the mold, it is necessary that the plastic be cooled very quickly to a temperature less than 100° C. so as to avoid the range of maximum crystallite growth....To avoid this crystal growth, the mold is typically cooled with the aid of a chilled heat transfer liquid circulated around the mold, the temperature of the heat transfer liquid being maintained less than about 16° C. and preferably less than about 10° C.

4. Bright also teaches (col. 2, ll. 50-54) that:

> The cavity member [of the mold] of the present invention achieves a quick heat transfer from the molten plastic to the cooling liquid, particularly in the region adjacent to the nozzle and gate of the cavity member [of the mold], thereby enabling

cycle times to be significantly reduced. [See also col. 3, ll. 30-64).

5. Bright does not mention (a) the PET introduced in its plasticating and injection unit in the claimed particle form (flake), (b) its plasticating and injection unit as the claimed plasticating screw extruder, and (c) its cooling temperature for a molten plastic cooled in the region adjacent to the nozzle and gate of the cavity of the preform mold to be at least 20° C below the extruder discharge temperature.

6. One of ordinary skill in the art can reasonably inferred that Bright's molten plastic is cooled by heat exchange with a liquid heat transfer medium to at least 20° C below an extruder discharge temperature prior to forming a preform in the cavity of a mold since Bright teaches pre-cooling the plastic melt in the vicinity of the gate of the cavity of the mold with a chilled heat transfer liquid having a temperature of preferably less than about 10° C for the purpose of quickly cooling the plastic melt in the cavity of the mold to a temperature less than 100° C from a temperature above about 275° C as indicated *supra*.

7. It is also well within the ambit of one of ordinary skill in the art to pre-cool the plastic melt to an optimum temperature, such as those claimed, for the purpose of quickly cooling the resulting plastic melt in the cavity of the mold to a temperature less than 100° C as indicated *supra*.

8. Hata teaches employing resin particles in a screw extruder to deliver a molten polymer to the cavity of a mold, which is cooled by a liquid coolant that flows through the vicinity of the cavity of the mold (col. 1, ll. 54-63, col. 22, ll. 1-23, and Fig. 16).

9. Takahashi teaches polyester pellets, particularly polyethylene terephthalate containing pellets having an average diameter of 2.0 to 5.0 mm, useful for making containers, such as bottles (col. 1, ll. 5-22 and col. 10. ll. 5-12).

10. Appellant acknowledges (Spec. 1) that:

> Conventional blow molding operations, such as those used to produce plastic containers, utilize an extruder to melt and homogenize plastic pellets, to prepare a polymer melt from which a blow molding preform may be produced.

11. Appellant acknowledges that "[t]he polymer flakes that are useful in the present invention may comprise any plastic, or combinations, blends, or copolymers of plastics, known to be useful in the blow molding of containers" (Spec. 4, ll. 1-4).

12. According to Appellant (Spec. 4, ll. 10-16):

> By the term "polymer flakes" as it is used herein is meant particles of those polymers set-forth above, which are generally *commercially available in the form of flakes, chunks, sphere, pellets, and the like* and which are generally made *commercially available* in bulk in a substantially uniform average mean particles size from about 1/8 inch to about ¾ inch. [Emphasis added.]

13. Appellant acknowledges that a conventional plasticizing or plasticating screw extruder is known to be useful for producing a polymer melt for forming a blow molding preform (Spec. 1. l. 27 to 2, l. 2 and Spec. 4, ll. 17-19).

14. Appellant acknowledges that "[c]onventional apparatus and methods for cooling by means of quench oil systems are well known in the art" (Spec. 5, ll. 18-20).

15. Appellant acknowledges (Spec. 5, ll. 22-26) that:

> Methods and apparatus for preparing a preform from a polymer melt stream are well known in the art. The preform thus produced may thereafter be blow molded by conventional techniques to from a plastic container.

REJECTIONS (3) AND (4)

16. Belcher teaches a process for extrusion blow molding polyethylene terephthalate articles, comprising charging suitable PET pellets, such as those commercially sold under the name Eastman's 7352, 9663, 9921, and 9899; ICI's 5122c and 5822c; Goodyear's 7207 and 8006; and American Hoechst's T-95, in plasticating screw extruders to produce a molten PET having a discharge temperature of about 490° F to 520° F (col. 2, l. 33 to co. 4, l. 15, and col. 11, 10-55).

17. Belcher teaches immediately cooling the molten PET in a vacuum box with cooling means, i.e., water cooling, to a temperature below the glass transition temperature, Tg, of PET (155° F to 160° F) and then heating the cooled PET within the stretch orientation temperature prior to subjecting it to blow molding in a mold (col. 4, ll. 16-51 and col. 11, ll. 10-55).

18. Schwarzkopf teaches using a fluid cooling jacket to cool molten polymers is known. (See generally Schwarzkopf).

19. Takahashi teaches polyester pellets, particularly polyethylene terephthalate containing pellets having an average diameter of 2.0 to 5.0 mm, useful for making containers, such as bottles (col. 1, ll. 5-22 and col. 10. ll. 5-12).

20. Appellant acknowledges (Spec. 1) that:

> Conventional blow molding operations, such as those used to produce plastic containers, utilize an extruder to melt and homogenize plastic pellets, to prepare a polymer melt from which a blow molding preform may be produced.

21. Appellant acknowledges that "[t]he polymer flakes that are useful in the present invention may comprise any plastic, or combinations, blends, or copolymers of plastics, known to be useful in the blow molding of containers" Spec. 4, ll. 1-4).

22. According to Appellant (Spec. 4, ll. 10-16):

> By the term "polymer flakes" as it is used herein is meant particles of those polymers set-forth above, which are generally *commercially available in the form of flakes, chunks, sphere, pellets, and the like* and which are generally made *commercially available* in bulk in a substantially uniform average mean particles size from about 1/8 inch to about ¾ inch. [Emphasis added.]

23. Appellant acknowledges that "[c]onventional apparatus and methods for cooling by means of quench oil systems are well known in the art" (Spec. 5, ll. 18-20).

PRINCIPLES OF LAW

In making a patentability determination, analysis must begin with the question, "what is the invention claimed?" since "[c]laim interpretation, . . . will normally control the remainder of the decisional process." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567-68 (Fed. Cir. 1987). During examination, claims terms must be given their broadest reasonable construction consistent with the Specification. *In re Icon Health and Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007)("[T]he PTO must give

claims their broadest reasonable construction consistent with the specification. . . . Therefore, we look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation.").

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations, if any. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). As stated in *KSR Int'l Co., v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41 (2007):

> [A]nalysis [of whether the subject matter of a claim would have been prima facie obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.

KSR disapproved a rigid approach to obviousness (*i.e.*, an analysis *limited to* lack of teaching, suggestion, or motivation). *KSR*, 127 S. Ct. at 1741 ("The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the explicit content of issued patents."). *See also DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006) ("Our suggestion test is in actuality quite flexible and not only permits, but *requires*, consideration of common knowledge and common sense"). The common knowledge attributable to one of ordinary skill in the art includes what was admittedly known in the art by Appellants at the time of the invention. *See In re Nomiya*, 509 F.2d 566, 570-71 (CCPA 1975) (The

admitted prior art in applicant's Specification may be used in determining the patentability of a claimed invention.); *see also In re Davis*, 305 F.2d 501, 503 (CCPA 1962).

KSR further instructs that "when a patent 'simply arranges old elements with each performing the same function it had been known to perform' and yields no more than one would expect from such an arrangement, the combination is obvious." *KSR*, 127 S. Ct. at 1740 (*quoting Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 282 (1976)).

"[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955) ("[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.").

ISSUES, ANALYSES and CONCLUSIONS OF LAW

REJECTIONS (1) AND (2)

As indicated *supra*, Bright teaches a process for preparing a blow molding preform, which comprises providing molten polyethylene terephthalate (PET) from a plasticating and injection unit subject to a temperature above about 275° C to a preform mold via a heated nozzle unit coupled to the plasticating and injection unit. Although Bright does not mention the PET introduced in its plasticating and injection unit in the claimed particle form and its plasticating and injection unit as the claimed plasticating screw extruder, Hata teaches employing resin particles in a screw extruder to deliver a molten polymer to the cavity of a mold cooled by

a liquid coolant. More importantly, Appellant acknowledges that the claimed polymer flakes (inclusive of flakes, chunks, sphere, pellets and like having a mean particle size from about 1/8 inch to ¾ inch) are known for blow molding and are commercially available at the time of the invention. Appellant also acknowledges that the conventional plasticating screw extruders included by the plasticating and injection unit taught by Bright are known to homogenize such polymer pellets to deliver a polymer melt for blow molding.

Given the above knowledge, we concur with the Examiner that one of ordinary skill in the art would have been led to employ the claimed polymer flakes, together a conventional plasticating and injection unit, such as the claimed conventional plasticating screw extruder, to form a PET melt for the purpose of forming a blow molding preform in the process of Bright.

Thus, the dispositive question is: Would one of ordinary skill in the art have been led to cool the resulting polymer melt by heat exchange with a liquid heat transfer medium to at least 20° C below an extruder discharge temperature prior to forming a blow molding preform within the meaning of 35 U.S.C. § 103? On this record, we answer this question in the affirmative.

As indicated *supra*, Bright teaches that:

> Upon injection of the PET into the mold, it is necessary that the plastic be cooled very quickly to a temperature less than 100° C so as to avoid the range of maximum crystallite growth….To avoid this crystal growth, the mold is typically cooled with the aid of a chilled heat transfer liquid circulated around the mold, the temperature of the heat transfer liquid being maintained less than about 16° C and preferably less than about 10° C.

> The cavity member [of the mold] of the present invention achieves a quick heat transfer from the molten plastic to the cooling liquid, particularly in the region adjacent to the nozzle and gate of the cavity member [of the mold], thereby enabling cycle times to be significantly reduced. [See also col. 3, ll. 30-64).

In other words, Bright not only teaches cooling the plastic (PET) melt in the cavity of the mold with a chilled heat transfer liquid having a temperature preferably less than about 10° C, but also teaches pre-cooling the plastic (PET) melt in the vicinity of the gate of the cavity of the mold with the same chilled heat transfer liquid for the purpose of quickly cooling the plastic (PET) melt in the cavity of the mold to a temperature less than 100° C from a temperature above about 275° C.

It follows that one of ordinary skill in the art would have reasonably inferred from Bright that the plastic (PET) melt from a plasticating and injection unit, such as the claimed conventional plasticating screw extruder, is cooled indirectly by a liquid heat transfer medium to at least 20° C below an extruder discharge temperature upon contacting a chilled heat transfer liquid having a temperature preferably less than about 10° prior to forming a preform in the cavity of a mold in the process of Bright within the meaning of 35 U.S.C. § 103. In any event, it is well within the ambit of one of ordinary skill in the art to pre-cool the polymer (PET) melt to an optimum temperature, such as that claimed, for the purpose of quickly cooling the resulting polymer melt in the cavity of the mold as suggested by Bright.

Accordingly, based on the totality of the record, including due consideration of Appellant's arguments, we hold that the preponderance of evidence weighs most heavily in favor of obviousness regarding the subject

matter recited in claims 1 through 10 within the meaning of 35 U.S.C. § 103(a).

REJECTIONS (3) AND (4)

Belcher teaches a process for extrusion blow molding polyethylene terephthalate articles, comprising charging suitable PET pellets, such as those commercially sold under the name Eastman's 7352, 9663, 9921, and 9899; ICI's 5122c and 5822c; Goodyear's 7207 and 8006; and American Hoechst's T-95, in plasticating screw extruders to produce a molten PET having a discharge temperature of about 490° F to 520° F. The claimed commercially available and admittedly known polymer flakes for blow molding (inclusive of flakes, chunks, sphere, pellets and like having a mean particle size from about 1/8 inch to ¾ inch) are embraced by the suitable blow molding PET pellets taught by Belcher.

Belcher also teaches immediately cooling the molten PET in a vacuum box with cooling means, i.e., water cooling, to a temperature below the glass transition temperature, Tg, of PET (155° F to 160° F) and then heating the cooled PET within the stretch orientation temperature prior to subjecting it to blow molding in a mold (col. 4, ll. 16-51 and col. 11, ll. 10-55).

Thus, the dispositive question is: Does Belcher's cooling of the polymer melt indirectly with a liquid heat transfer medium to at least 20° C below an extruder discharge temperature occur prior to the claimed forming step within the meaning of 35 U.S.C. § 103? On this record, we answer this question in the affirmative.

As is apparent from claim 1, the claimed indirect heat exchange liquid cooling step must occur prior to "forming the cooled polymer melt into a blow molding preform". The Specification, however, does not define the claimed forming step as excluding Belcher's heating step for forming a PET article useful for subsequent blow molding. Nor does the Specification define the claimed forming step as including Belcher's indirect heat exchange liquid cooling step which occurs prior to forming a preform used in subsequent blow molding (a heated PET article within the stretch orientation temperature for subsequent blow molding).

Hence, we concur with the Examiner that Belcher teaches cooling the polymer melt indirectly with a liquid heat transfer medium to at least 20° C below an extruder discharge temperature prior to the claimed forming step within the meaning of 35 U.S.C. § 103.

Accordingly, based on the totality of the record, including due consideration of Appellant's arguments, we hold that the preponderance of evidence weighs most heavily in favor of obviousness regarding the subject matter recited in claims 1 through 10 within the meaning of 35 U.S.C. § 103(a).

ORDER

The decision of the Examiner is affirmed.

TIME PERIOD

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

PL Initial:
sld

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